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ACTIVE INGREDIENT MICRO CAPSULE FOR THE TARGETED TIME- AND VOLUME-CONTROLLED RELEASE OF DRUGS

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Description

The subject matter of the present invention relates to a method and a device by means of which drugs, preferably in paste or liquid form, possibly using penetration-mediating agents, for example, DMSO, can be introduced in a quantity- and time-controlled manner into the subtissue of the skin.

Also conceivable is an implantable form of a capsule or an electronically controllable active ingredient capsule which can be "anchored" in the form of a depot system, e.g., in the pharyngeal cavity where it can be made to release an appropriate active ingredient at predeterminable intervals.

Such a device is, however, especially useful when it is used as a controllable active ingredient capsule in the form of transdermal systems (subcutaneously acting patches with active ingredients).

One of the advantages of this new form of preparation is that the physician or the programmable (or permanently programmed) active ingredient capsule can determine the release of the active ingredient especially in elderly and potentially forgetful patients. It is also possible for a control unit (timing module) to reduce or completely stop the release of the active ingredient, e.g., during a rest phase (night).

This was not possible with the transdermal systems known so far.

The subject matter of the present invention thus relates to a depot chamber containing the active ingredient, which depot chamber is connected to an electrochemical cell (such as is manufactured, for example, by the firm of Simatec AG, CH 3360 Herzogenbuchsee (Switzerland)) which, when the two poles are short-circuited, generates hydrogen gas (or oxygen). Thus, pressure is exerted on the pouch containing active ingredient (here called depot chamber) which is preferably separated by a suitable film. Via the communicating channels or a capillary/transparent film which is affixed to appropriate regions of the skin by means of the conventional adhesive strip method, the active ingredient is then released at a specific time and in a specific quantity.

The gas production is essentially equivalent to current, i.e., the quantity of gas per unit of time can be determined by means of an external resistor of a permanent or adjustable type. The gas cells operate without any impressed current. The dimensions of a gas-generating cell measure approximately 7.8 x 3.5 mm. Depending on the type used, the capacity is approximately 25-150 mL of H_2 gas.

The present invention next provides for a fixed connection with a microchip mounted as an SMD. The complete unit of the active ingredient capsule is formed by: the gas-generating cell (as the drive), a depot chamber (which contains the active ingredient), the transfer element (a permeable film or a cannular system), and the control chip mentioned above.

It is also possible to place this active ingredient capsule into the rectum or into the vaginal region.

According to another embodiment, it may also be possible for the active ingredient and/or the gas generation in the form of an aerosol medium to be controlled via a glucose sensor so as to control, e.g., the insulin delivery in diabetic patients. In addition, these new transdermal systems might be able to emit an acoustic signal (whistling sound) so that the patient can monitor the time at which the active ingredient is released. Both as a function check and to monitor his status (prior to/afterwards) on his own.

Claims

1. A method for the targeted release of drugs, characterized in that a device designated here as an active ingredient capsule is used, which device comprises a (drug) depot chamber which is connected to a gas-generating cell and an IC (e.g., a timing module) so as to release a predefined quantity of the active ingredient by way of a time- and quantity-controlled gas volume and to administer it to the patient.

2. The method as in Claim 1, characterized in that the active ingredient capsule is designed as a transdermal system (patch with an integrated active ingredient capsule).

3. The method as in Claim 1, characterized in that an active ingredient capsule is used, which capsule, as a result of having a smooth shape, can be swallowed.

4. The method as in Claim 1, characterized in that the controllable active ingredient capsule can be permanently anchored in openings of the body.

5. The method as in Claim 1, characterized in that the active ingredient capsule can be implanted; with the possibility of changing the data that had been entered for releasing the drug in a contact-free manner after overriding a special code.